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U. S. DEPARTMENT OF AGRICULTURE.

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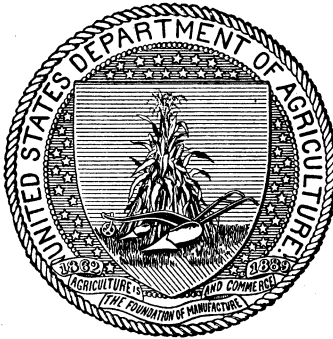
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SEED CORN.

BY

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF THE CHIEF,
Washington, D. C., July 22, 1910.

SIR: I have the honor to transmit herewith a manuscript entitled "Seed Corn," by Mr. C. P. Hartley, Physiologist in Charge of Corn Investigations, and recommend that it be published as a Farmers' Bulletin.

Each spring during corn-planting time, first from the Southern, then from the Central, and later from the Northern States, the United States Department of Agriculture receives thousands of anxious inquiries for sources from which good seed corn can be purchased. This bulletin should prove a timely reply to future inquiries of this nature. Any farmer can apply the suggestions made in these pages, and by so doing provide himself with the best seed corn his community affords, which is likely to produce a better crop than any seed he can purchase at planting time.

Respectfully,

WM. A. TAYLOR,
Acting Chief of Bureau.

Hon. JAMES WILSON,
Secretary of Agriculture.

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SEED CORN.^a

SMALL YIELDS DUE TO POOR SEED CORN CAN BE PREVENTED.

The average production of corn to the acre for the entire United States is but 26 bushels, yet in practically every section four times that quantity is frequently produced. Improvement of the quality of seed is the least expensive method of increasing the yield per acre.

There is each spring a scarcity of good seed corn. This condition is all the more regrettable because it need not exist and it is much more serious than commonly supposed because many do not fully realize the tremendous loss to themselves and the country due to planting inferior seed. A full stand of plants may be obtained from inferior seed, but the yield will not be the best possible.

The loss is due to delay or negligence. It can be prevented by the selection of seed corn in the autumn. If good seed corn could be manufactured in a few weeks' time many factories would be working day and night from March till June. Each spring the writer regrets the unfortunate position of many thousands who too late inform the United States Department of Agriculture of their willingness to pay good prices for good seed corn and of their inability to obtain it.

THE VERY BEST SEED IS AVAILABLE AT RIPENING TIME.

Autumn is the time to prepare for a profitable corn crop the following season. It is hoped that this bulletin will prove more valuable and timely than any replies that can be written to springtime correspondents regarding seed corn. Its object is to prevent the scarcity

^a Copies of any of the following Farmers' Bulletins upon the subject of corn will be sent free of charge upon application to a Senator or Representative in Congress or to the Secretary of Agriculture: 81, Corn Growing in the South; 229, The Production of Good Seed Corn; 253, The Germination of Seed Corn; 272, A Successful Hog and Seed-Corn Farm; 298, Food Value of Corn and Corn Products; 303, Corn-Harvesting Machinery; 313, Harvesting and Storing Corn; 325, Small Farms in the Corn Belt; 400, A More Profitable Corn-Planting Method; 414, Corn Cultivation.

each spring of first-class seed corn. This scarcity can be prevented by selecting the seed when it is most abundant and when the very best can be obtained—at ripening time before it has been in any way reduced in vitality. Many let this opportunity pass, expecting to purchase their seed corn, only to find that they can not buy at any price in the winter or spring as good seed as they could have selected in the autumn.

WHERE TO OBTAIN THE BEST POSSIBLE SEED CORN.

Until a community has its experienced and honest corn breeder, the best place for the farmer to obtain seed corn is from fields on his farm or in his neighborhood that were planted with a variety that has generally proved most successful in that locality.

CORN BREEDING IS A SPECIAL LINE OF WORK.

Well-conducted corn breeding requires special methods that general farmers have not time to apply. If there is in your locality a corn breeder who each year demonstrates the superiority of his corn, you should pay him well for his superior seed. Five dollars a bushel will be a profitable bargain for both parties. Such corn breeders are improving corn as cattle breeders have improved cattle.

The general farmer is a propagator rather than a breeder of corn. He profits by the careful work of the breeder by adopting the higher yielding strains and propagating them.^a

WHAT CONSTITUTES GOOD SEED CORN?

By far too many consider seed good simply because it will grow. To be first class, seed must be—

(1) Well adapted to the seasonal and soil conditions where it is to be planted.

(2) Grown on productive plants of a productive variety.

(3) Well matured, and preserved from ripening time till planting time in a manner that will retain its full vigor.

The importance of the three requirements just enumerated has been demonstrated experimentally by the Office of Corn Investigations of the Bureau of Plant Industry. The results given briefly, as enumerated, are as follows:

(1) For a series of five years 12 well-bred varieties were tested in 10 Northern States, equivalent lots of seed being used in each State.

^a Those especially interested in the improvement of corn by methods of breeding can receive detailed information upon application to the Secretary of Agriculture.

Varieties that produced most in some States were among the poorest in others.

(2) Seed ears taken from the highest yielding rows of ear-to-row breeding plats have repeatedly produced better than seed ears taken from poorer yielding rows. Seed ears from the best producing stalks found in a general field produced more than seed ears taken without considering the productiveness of the parent stalks.

(3) Four bushels of ears were divided into two equal parts, one part being well taken care of and the other placed in a barn as corn is ordinarily cribbed. The well-preserved seed gave a 12 per cent increase in production on poor soil and a 27 per cent increase on fertile soil, notwithstanding the fact that both lots of seed germinated equally well.^a

HOW TO GATHER SEED CORN.

MAKE SEED-CORN GATHERING A SPECIAL TASK.

At corn-ripening time drop all other business and select an abundance of seed corn. The process is too important to be conducted incidentally while husking. When selecting seed corn give the process your entire attention. Get the very best that is to be had and preserve it well, and your increased yields will return you more profit than any other work you can do on your farm.

The only proper way to select seed corn is from the stalks standing where they grew, as soon as ripe and before the first hard freeze.

PROPAGATE ONLY FROM THE BEST PRODUCING PLANTS.

As soon as the crop ripens, go through the field with seed-picking bags (fig. 1)^b and husk the ears from the stalks that have produced the most corn without having any special advantages, such as space, moisture, or fertility. Avoid the large ears on stalks standing singly with an unusual amount of space around them. Preference should be given the plants that have produced most heavily in competition with a full stand of less productive plants.

In all localities the inherent tendency of the plant to produce heavily of sound, dry, shelled corn is of most importance.

Late-maturing plants with ears which are heavy because of an excessive amount of sap should be ignored. Sappiness greatly increases the weight and is likely to destroy the quality.

In the Central and Southern States, all other things being equal, short, thick stalks are preferable. Short stalks are not so easily

^a See Yearbook, U. S. Dept. of Agriculture, for 1902, p. 550.

^b The seed-corn picking bags shown in figure 1 are always open for filling and may be instantly opened at the bottom for emptying.

blown down and permit thicker planting. Thick stalks are not so easily broken down and in general are more productive than slender ones.

The tendency for corn to produce suckers is hereditary.^a Other things being equal, seed should be taken from stalks that have no suckers.

TREATMENT OF SEED IMMEDIATELY AFTER GATHERING.

The same day seed corn is gathered the husked ears should be put in a dry place where there is free circulation of air, and placed in such a manner that the ears do not touch each other. This is the only safe procedure. The writer has repeatedly seen good seed ruined



FIG. 1.—A field of corn showing a good method of selecting seed. The men are searching for plants that have produced heavily under average conditions and in close competition with less productive plants in the same and adjacent hills.

because it was thought to be already dry enough when gathered and that the precaution mentioned above was unnecessary. Many farmers believe that their autumns are so dry that such care is superfluous. Seed corn in every locality gathered at ripening time will be benefited by drying as suggested. If left in the husk long after ripening it may sprout or mildew during warm, wet weather or become infested with weevils.

The vitality of seed is often reduced by leaving it in a sack or in a pile for even a day after gathering. During warm weather, with some moisture in the cobs and kernels, the ears heat or mildew in a remarkably short time.

^a See Report, American Breeders' Association, vol. 2, 1906, p. 144.

The best possible treatment immediately after gathering is shown in figure 2. Binder twine will support 15 or 20 ears on a string, arranged in the manner illustrated. Ordinarily the best place to hang these strings of ears is in an open shed or loft.

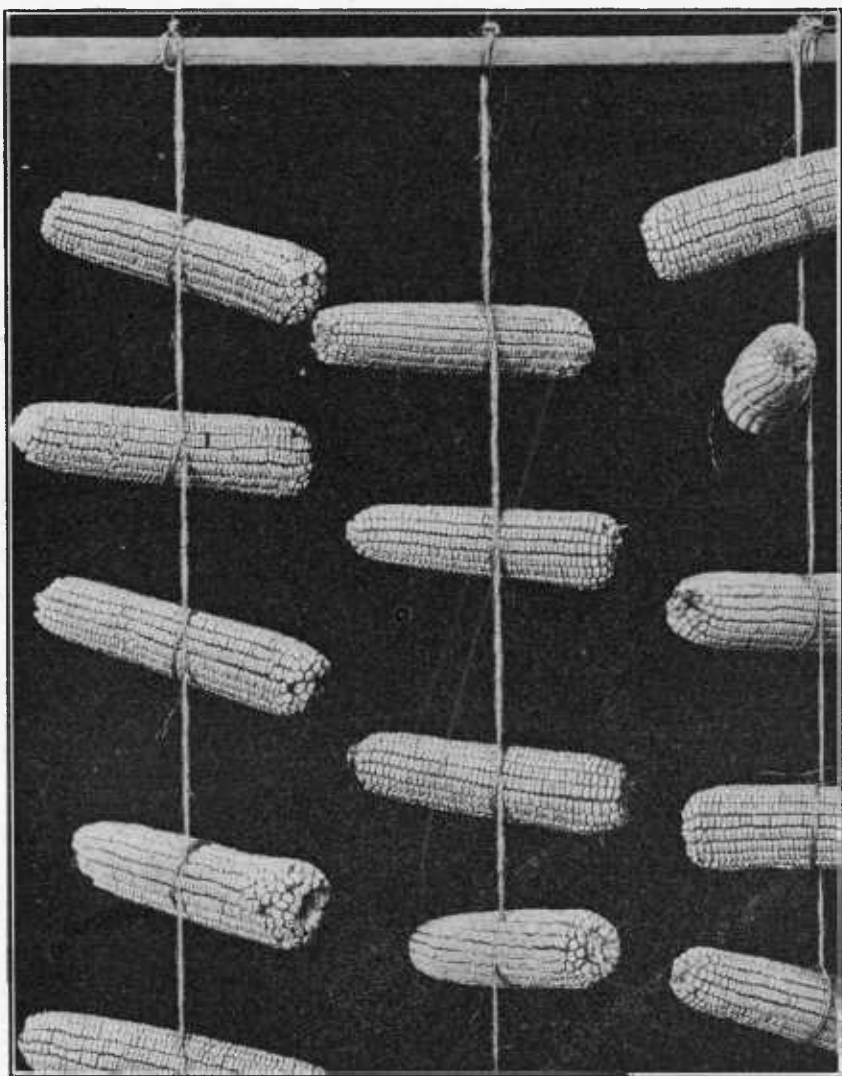


FIG. 2.—An ideal method of treating seed ears by stringing them immediately after they are gathered.

Permanent seed racks (fig. 3) are more convenient than the use of binder twine, and when they are located in a dry, breezy place the ears dry successfully.

Only during unusually damp weather at seed-gathering time will fire be necessary. If heat is employed in a poorly ventilated room it will do the seed ears more injury than good. If used the fire should be slow, long continued, and situated below the seed ears with good ventilation above them.

DESTROYING WEEVILS OR GRAIN MOTHS.

If at any time signs of weevils or grain moths show on the corn, it should be inclosed with carbon bisulphid^a in practically air-tight

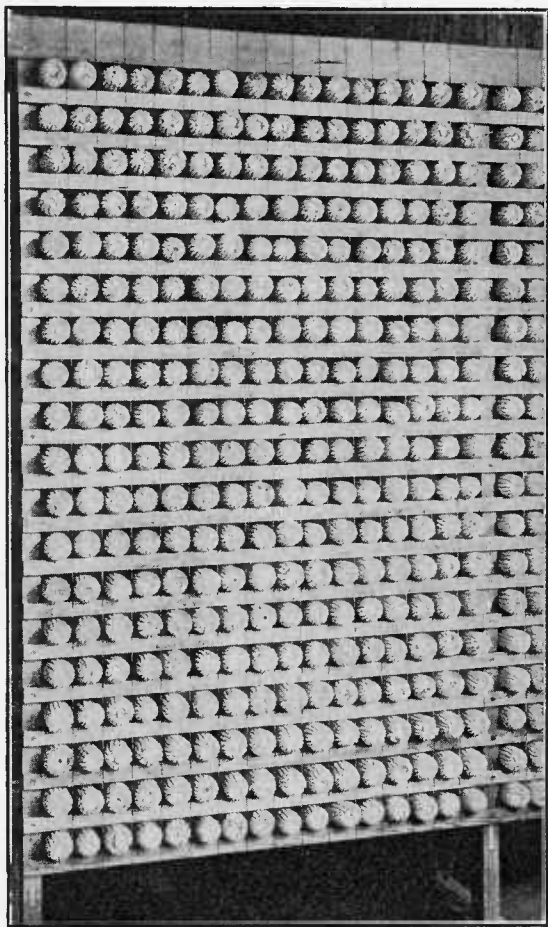


FIG. 3.—A good rack for drying seed corn.

rooms, bins, boxes, or barrels for forty-eight hours. The bisulphid should be placed in shallow dishes or pans on top of the seed. One-half pint is sufficient for a box or barrel holding 10 bushels or less. One pound, costing about 30 cents, is sufficient for a room or bin 10 feet each way. After fumigation the ears must be thoroughly aired, taking care that no fire is present when the fumigating box is opened.

WINTER STORAGE OF SEED CORN.

After hanging in the shed or lying on the racks for two months, the seed ears should be "dry as a bone" and contain less than 10 per cent

of moisture. They can remain where they dried or be stored in mouseproof barrels or boxes during the winter, but in either case

^a See "Carbon Bisulphid as an Insecticide," Farmers' Bulletin 145, U. S. Dept. of Agriculture.

must not be exposed to a damp atmosphere or they will absorb moisture and be injured. Some farmers place the thoroughly dried seed ears in the center of a wheat bin and fill the bin with loose, dry wheat.

PREVENTING INJURY FROM WEEVILS AND GRAIN MOTHS.

In localities where weevils and grain moths injure stored grain, the thoroughly dry seed ears should be stored in very tight mouseproof receptacles, with 1 pound of moth balls or naphthalene inclosed for each bushel of corn. This quantity tightly inclosed with the corn will prevent damage from these insects and will not injure the seed. The material will cost about 3 cents a pound. Thirty cents' worth will protect seed enough to plant 60 acres.

TESTING THE GERMINATION OF SEED CORN.

Seed corn that matured normally and has been properly preserved will grow satisfactorily. It is very poor management to neglect proper preservation and to spend time in the spring separating by germinating tests those ears that have been badly damaged from those that have been slightly damaged. Prevention is better than cure, and in this case a cure is impossible.

Ears slightly damaged by poor preservation may germinate well, but will produce less than if they had received better care.

Make a seed-corn testing box^a and test 100 ears separately. Be sure that each kernel tested is perfect in appearance and was not injured at the tip when removed from the ear. If 3 or more kernels out of 10 from any ear fail to grow, it will be advisable to test every ear in the entire supply of seed corn. If the 100 ears tested contain no poor ones, further testing of the supply is unnecessary.

GRADING SEED CORN.

Shelled corn is difficult to grade satisfactorily. The grading can be done better before the ears are shelled. If the seed ears vary greatly as to size of kernel they should be separated into two or three grades according to size of kernel. These grades should be shelled separately, tested in the corn planter, and numbered to correspond with the number on the planter plates that are found to drop them most uniformly. These arrangements can be completed before the rush of spring work begins.

^a See Farmers' Bulletin 253, U. S. Dept. of Agriculture.

METHOD OF SHELLING.**SEED EARS SHOULD FIRST BE NUBBED.**

The first operation in properly shelling seed corn is the removal of the small kernels from the tips of the ears and the round thick kernels from the butts. The former are less productive than the other kernels of the ear. The round butt kernels are as productive as the other kernels of the ear, but do not plant uniformly in a planter.

HAND SHELLING IS THE BEST METHOD.

Shelling seed corn carefully by hand is profitable. The greater the acreage planted the greater the profit. Into a shallow pan or box each ear should be shelled separately, rejecting any worm-eaten or blemished kernels. If the supply from the one ear appears good and contains no poor kernels, it is poured into the general supply and another ear shelled in the same way.

SUMMARY.

If you have ever found yourself compelled to plant corn that was not fit for seed, do not be caught that way again. It is too discouraging to begin the season with poor prospects of a good crop. Get your seed at ripening time when the best quality is most plentiful. Get an abundance, enough for planting again what the high water may destroy and a supply for some farmer who may move into your community or for a neighbor who could not select his seed corn at the proper time.

Save seed only from the most profitable individuals with the same care you use in propagating your animals.

Care for each living kernel from the time it ripens until it is planted in a manner that will enable it to develop into a thrifty plant and produce one or more large ears. Do not expect germination tests made in the spring to restore vigor that proper gathering, drying, and storing would have retained.

Shell your seed carefully by hand.